

# SARS

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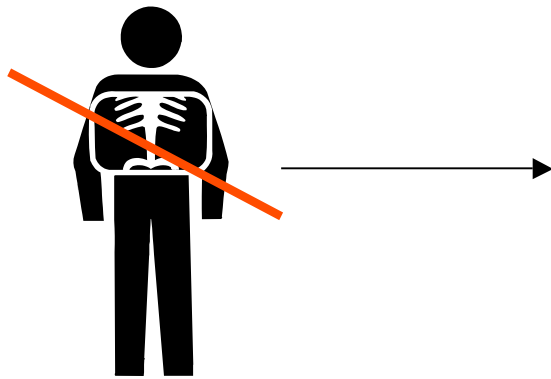
Allison McGeer, Mt. Sinai Hospital and University of Toronto



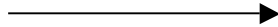
# The Toronto Outbreak

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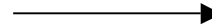
**Friday, March 7<sup>th</sup>**



**Index Case  
(Mother)**

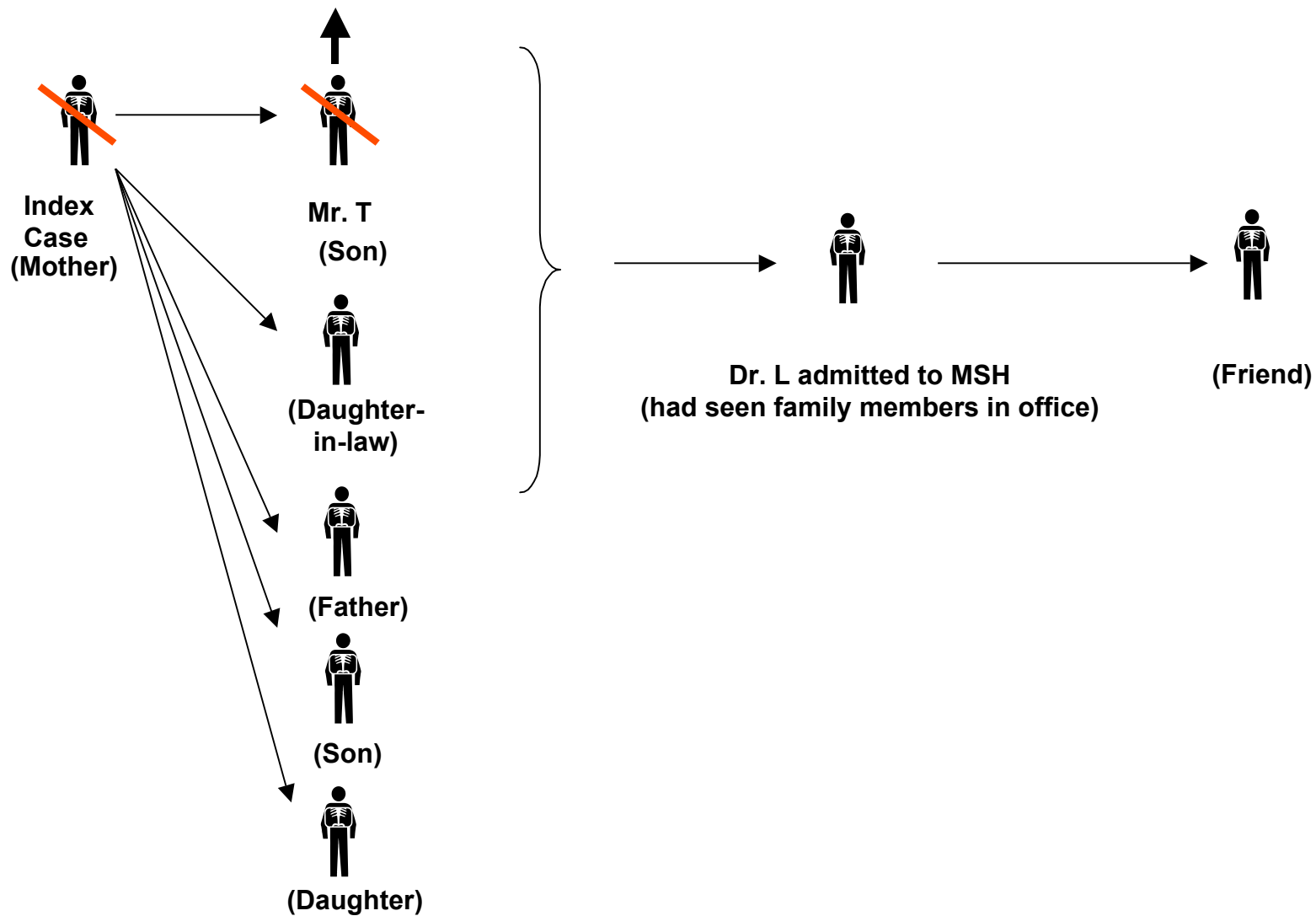


**Mr. T  
(Son)**



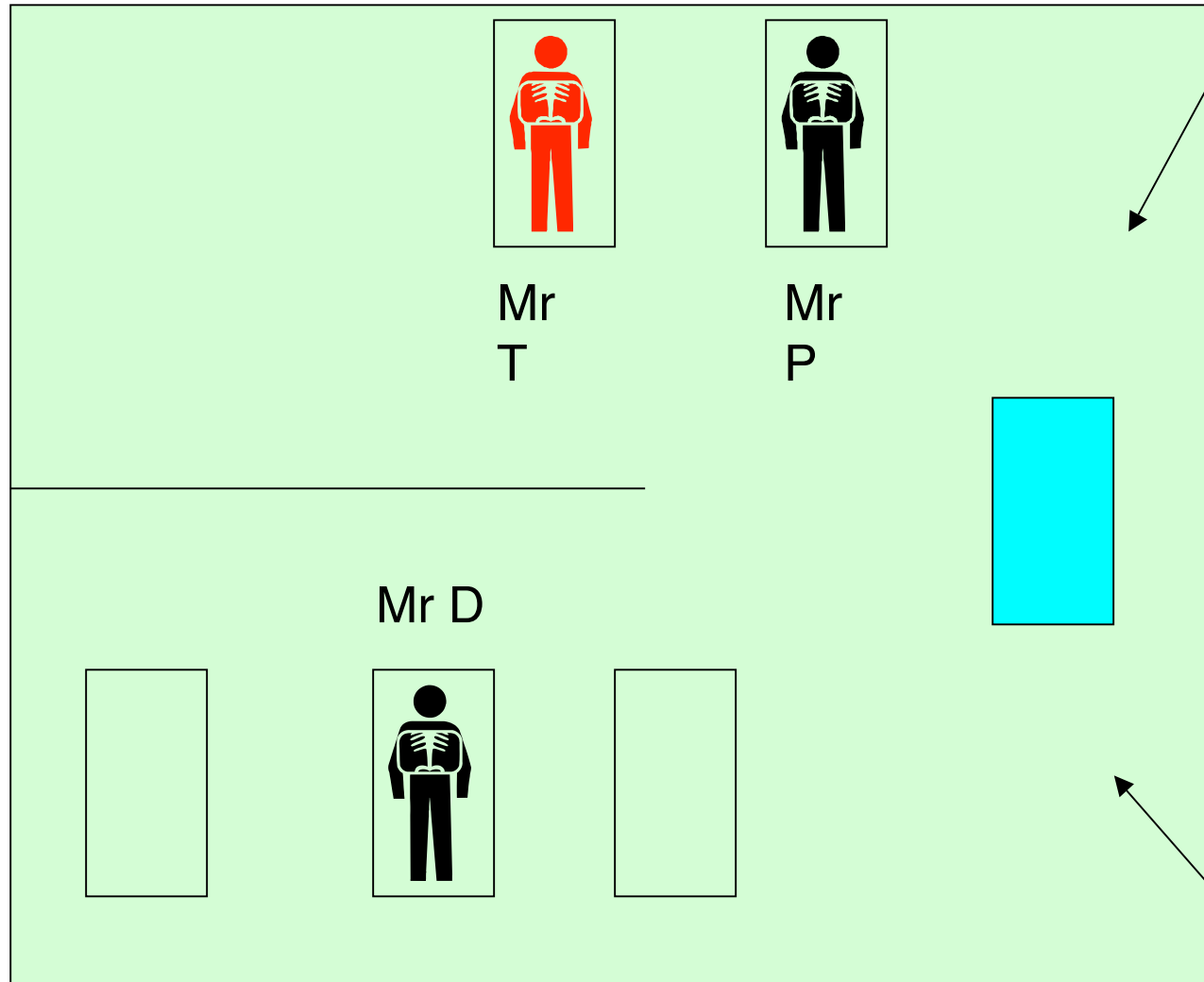
**SGH**

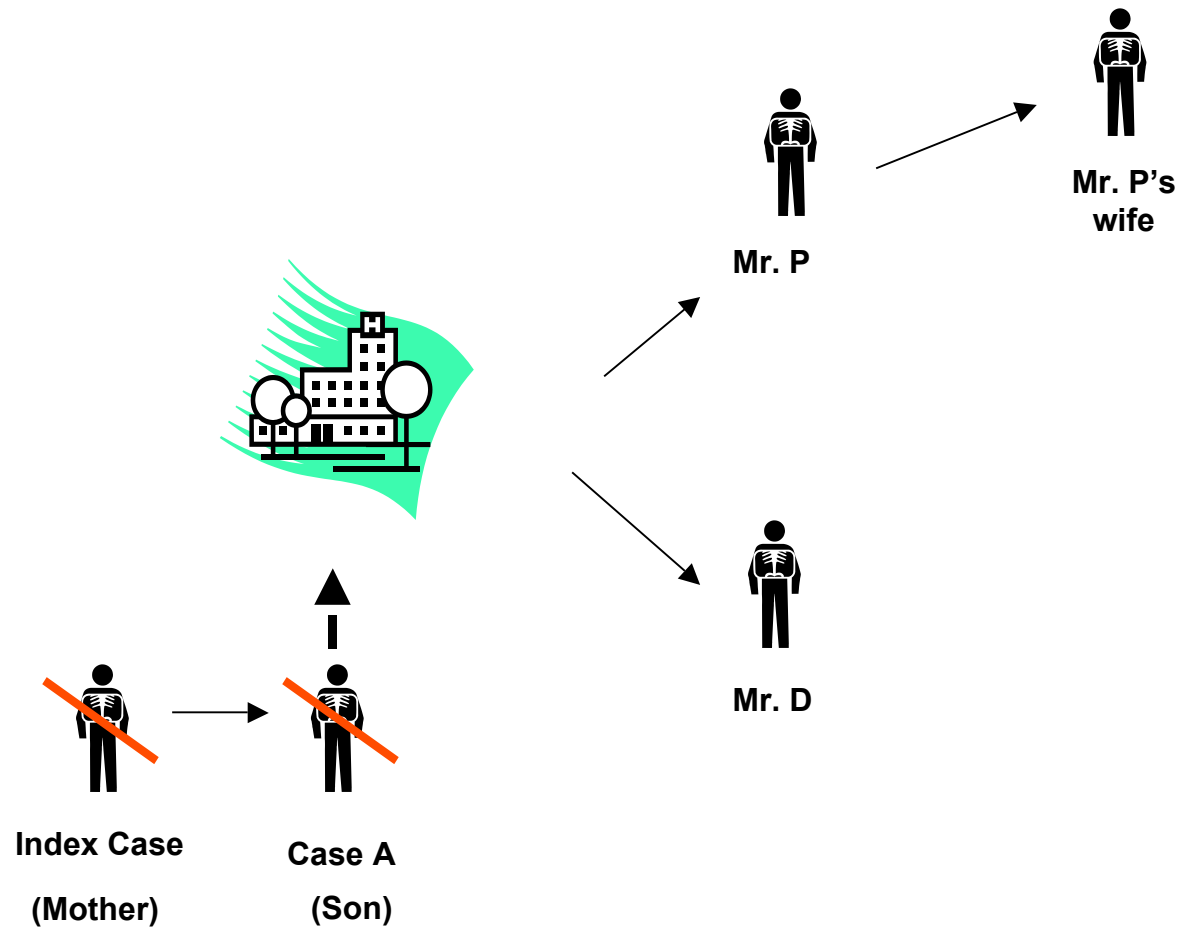
# March 15th

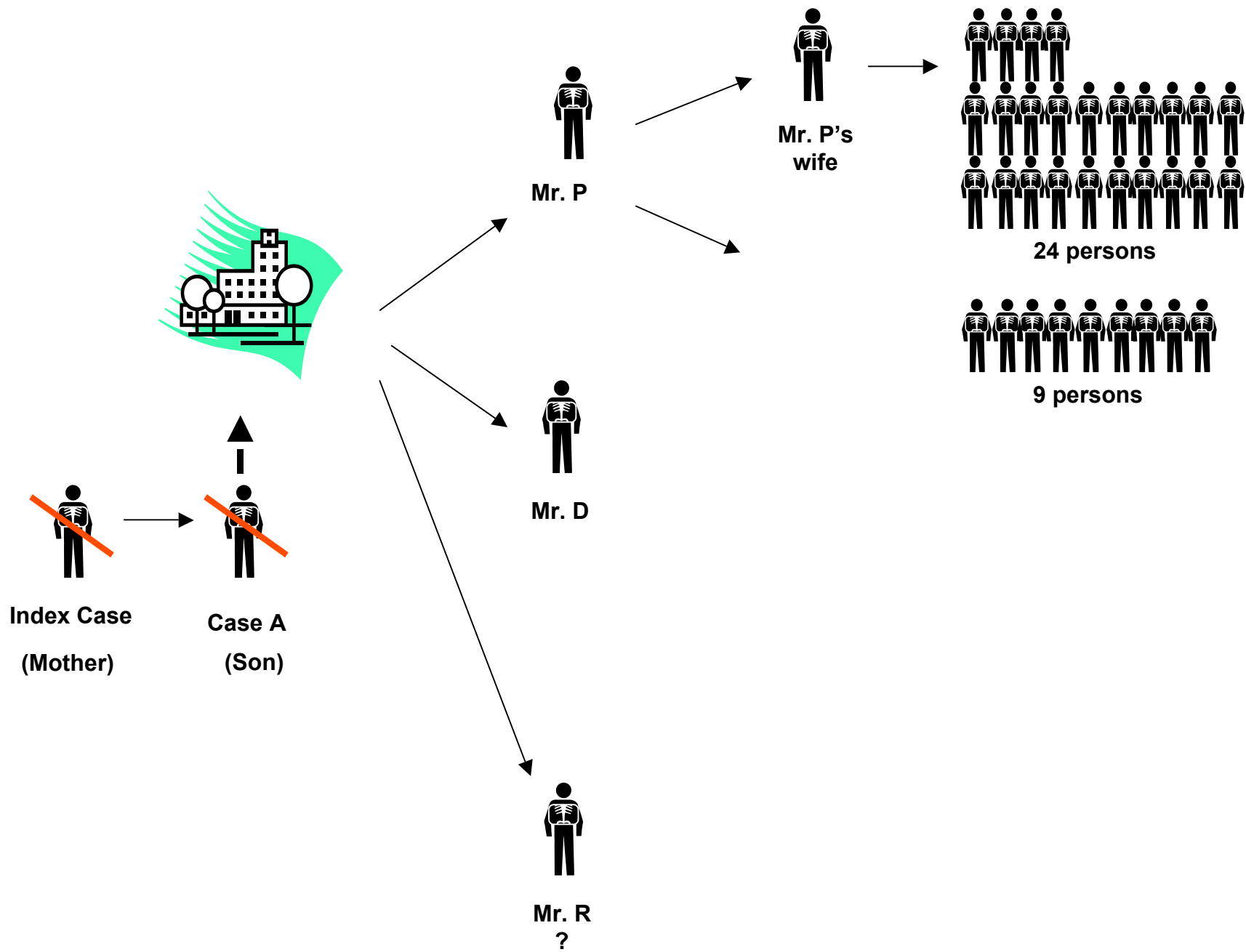


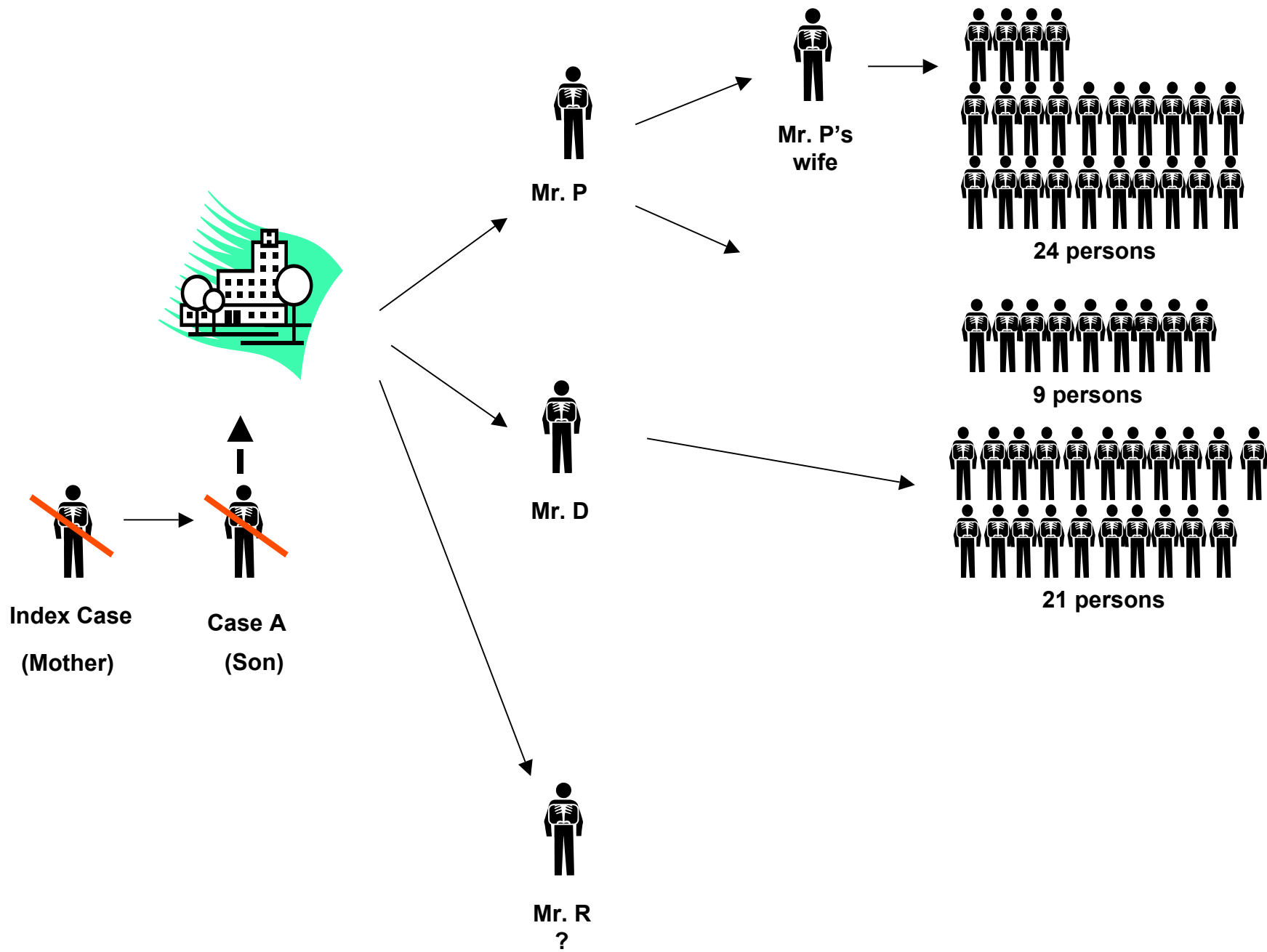
**Night of March 7<sup>th</sup>**

**Observation Unit ER SGH**

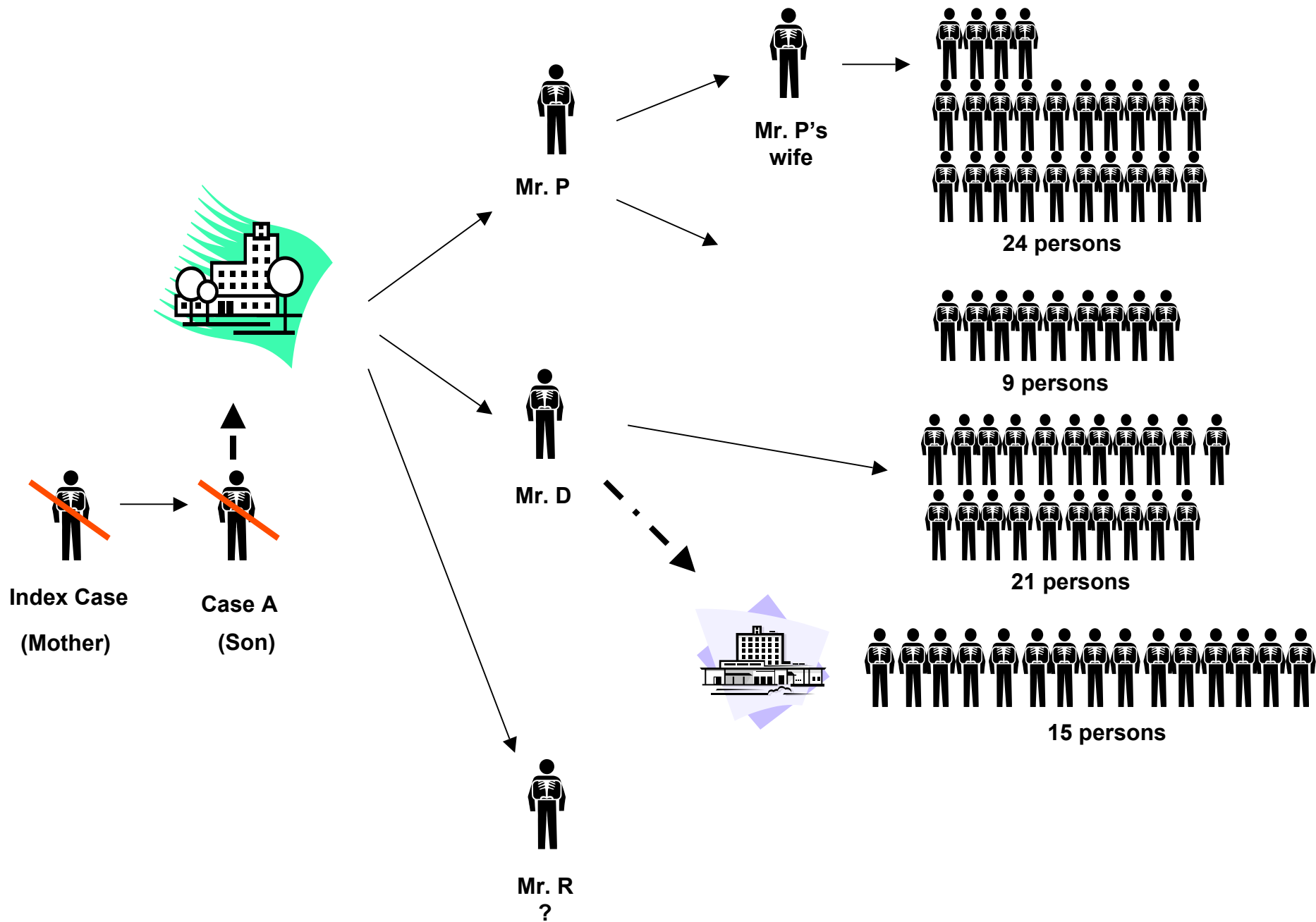


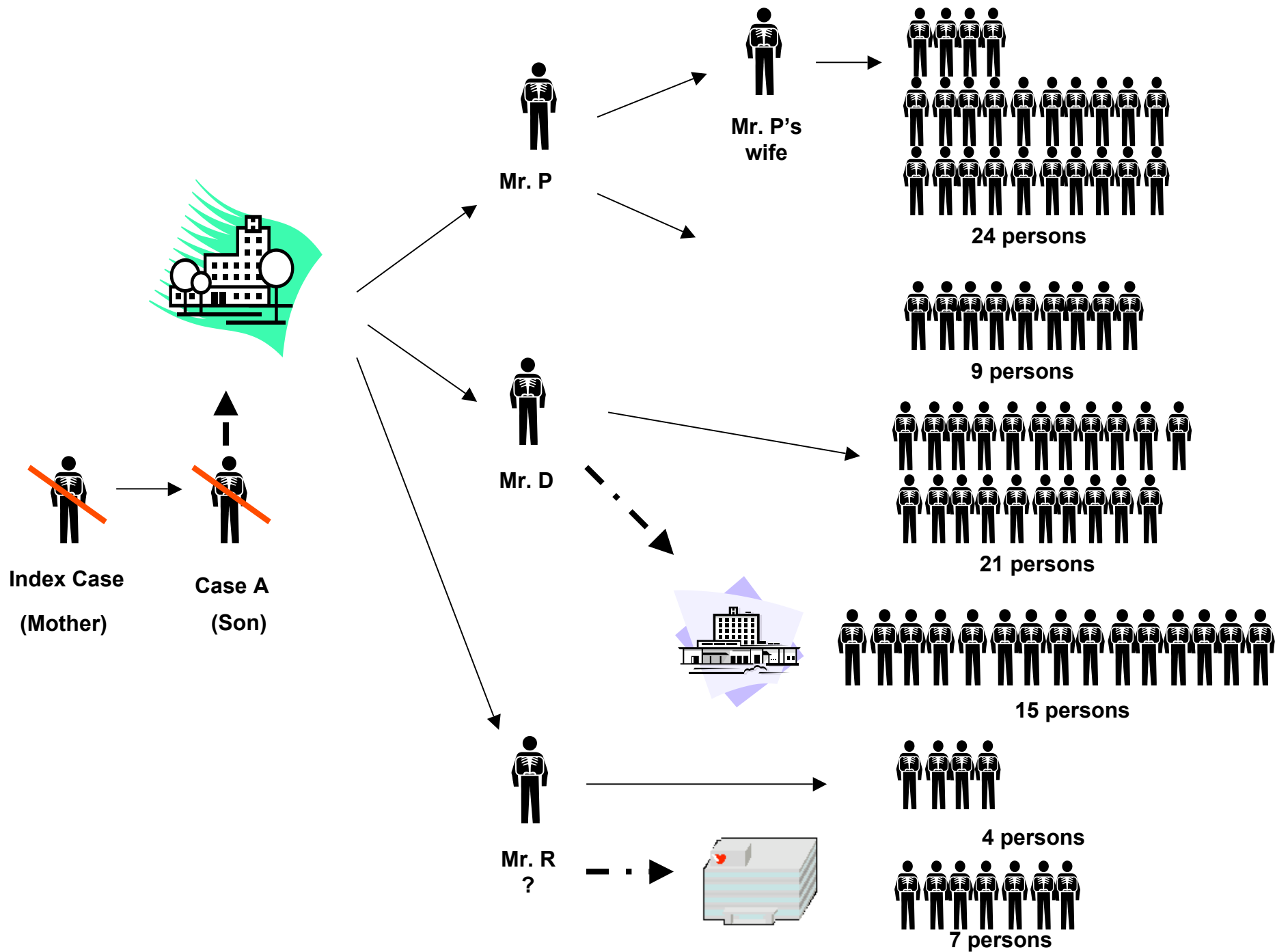














# Transmission sites

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- Hospitals (to patients, visitors, HCWs)
- Physician offices
- Households
- Families
  
- Uncommonly in “community”



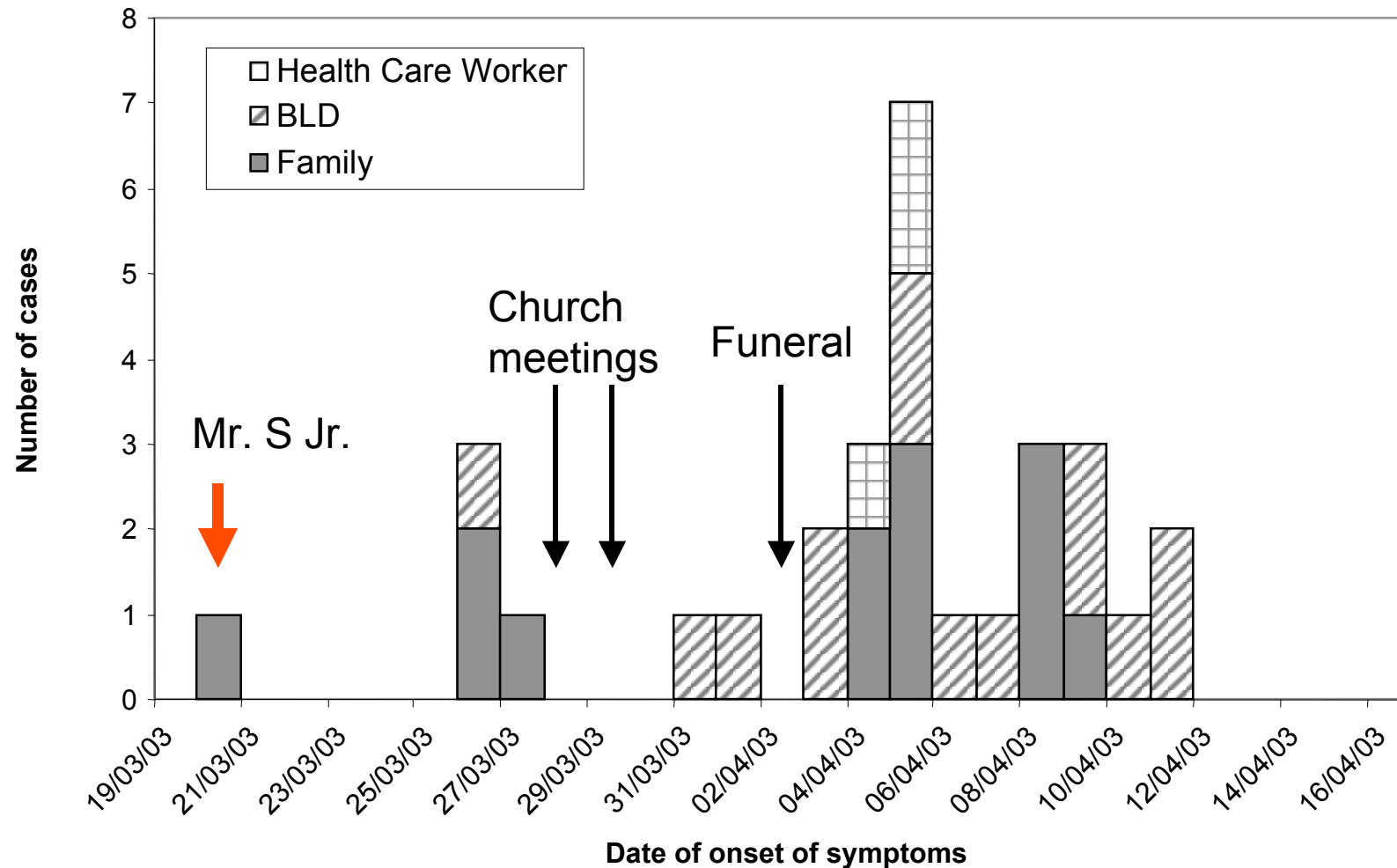
# **The Bukas-Loob Sa Diyos (BLD) Covenant Community**

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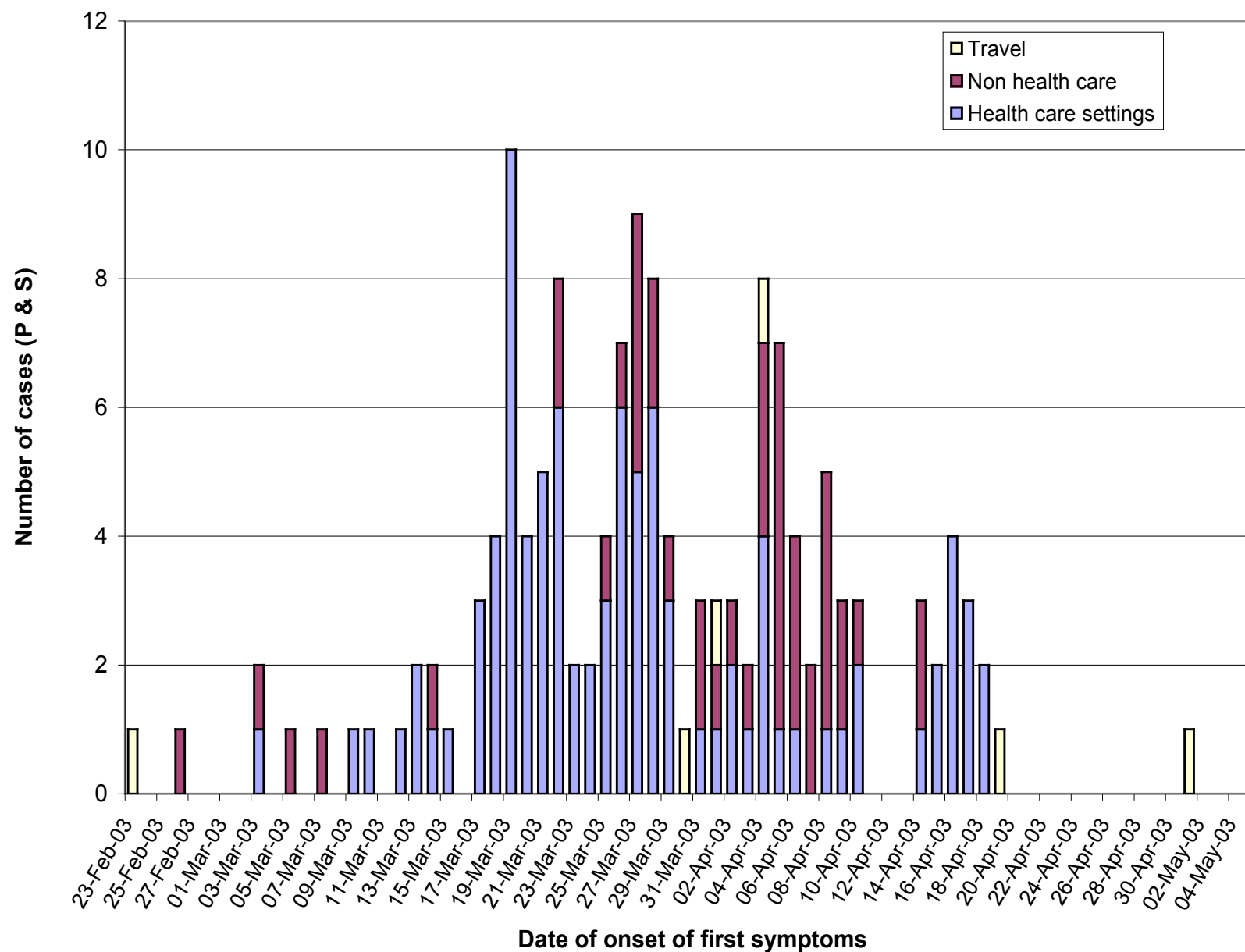
- **a Catholic Charismatic community**
- **500 members in Toronto**
- **Groups around North America**
- **activities include a variety of encounter programs - Youth Encounters, Singles Encounters, Solo Parents Encounters, Youth LSS and Family Encounters**

# Reported cases of SARS in cases linked to the BLD group

March 20 to April 16, 2003



# Toronto Area Probable and Suspect cases by source of infection May 5, 2003



**March 16th, 22:45-23:30**

## **Emergency SGH**

**Patient Waiting**

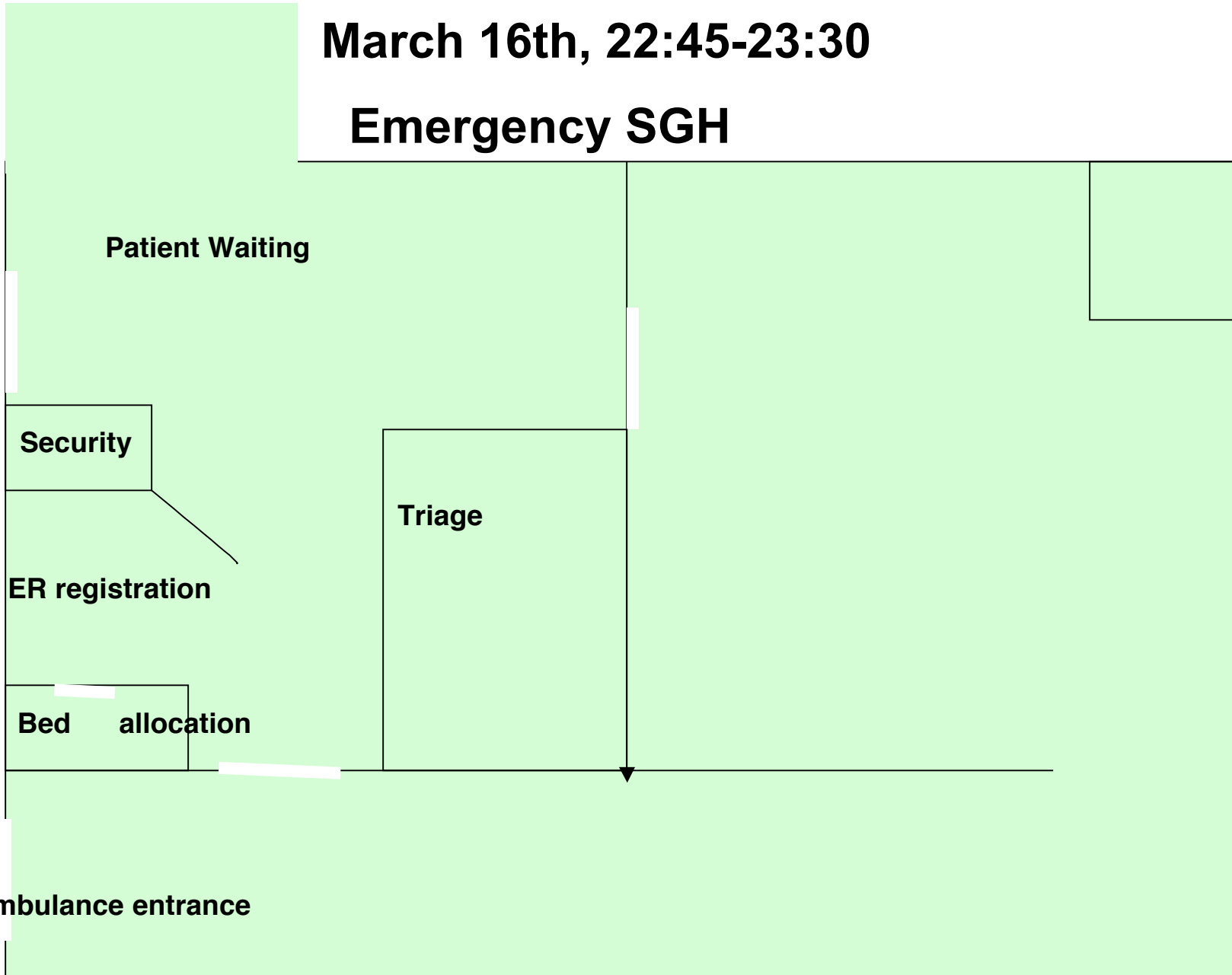
**Security**

**ER registration**

**Bed allocation**

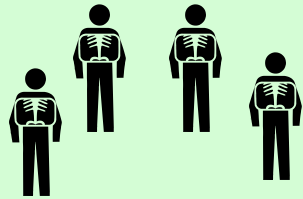
**Triage**

**Ambulance entrance**



**March 16th, 22:45-23:30**

## **Emergency SGH**



**5 patient visitors**

**Patient Waiting**



**Housekeeper**



**Primary Nurse**



**Security**

**Security guard**



**ER registration**



**3 Clerks**



**Bed allocation**

**Triage**



**Triage Nurse**



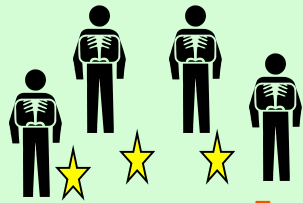
**Nurse**

**Ambulance entrance**



March 16th, 22:45-23:30

## Emergency SGH



5 patient visitors

Patient Waiting



Housekeeper



Primary Nurse



Security

Security guard



ER registration



Clerks



Bed allocation

Triage



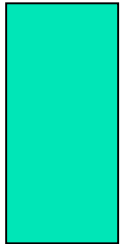
Triage Nurse



Nurse

Ambulance entrance

May 12/13  
(14hrs)

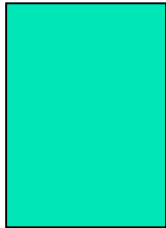


ER



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May 13/14  
(30 hrs)



Unit 1

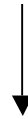


2 nurses  
2 roommates

May 15 - 22



Unit 2



*63 year old, post CVA*



# Clinical Disease

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# **Clinical Features and Short-term Outcomes of 144 Patients With SARS in the Greater Toronto Area**

(Booth et al. *JAMA express*)

# **A Major Outbreak of Severe Acute Respiratory Syndrome in Hong Kong**

(Lee et al. *NEJM* 348:1986-94)

# **Clinical progression and viral load in a community outbreak of coronavirus- associated SARS pneumonia: a prospective study**

(Peiris et al. *Lancet* online, May 9)



# Demographics

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Study population	144, 156, 75
Median age	45, 39, 40 yrs
Female	61%, 59%, 55%
Health care worker	51%, 54%



# Exposure

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Travel	3	(2.1%)
Home	35	(24%)
Hospital <sup>1</sup>	111	(77%)

\*Note:      <sup>1</sup>This group includes healthcare workers, patients and visitors.



# Course of Illness

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Seen prior to admission      49   (34%)

    ER                                23   (52%)

    Clinic/Doctor's office    18   (41%)

    Hospital                        3     (7%)

Median time from first  
visit until admission              3 days (2-5)<sup>1</sup>

Note: <sup>1</sup>25<sup>th</sup> and 75<sup>th</sup> percentiles are shown in parentheses



# Symptoms at presentation

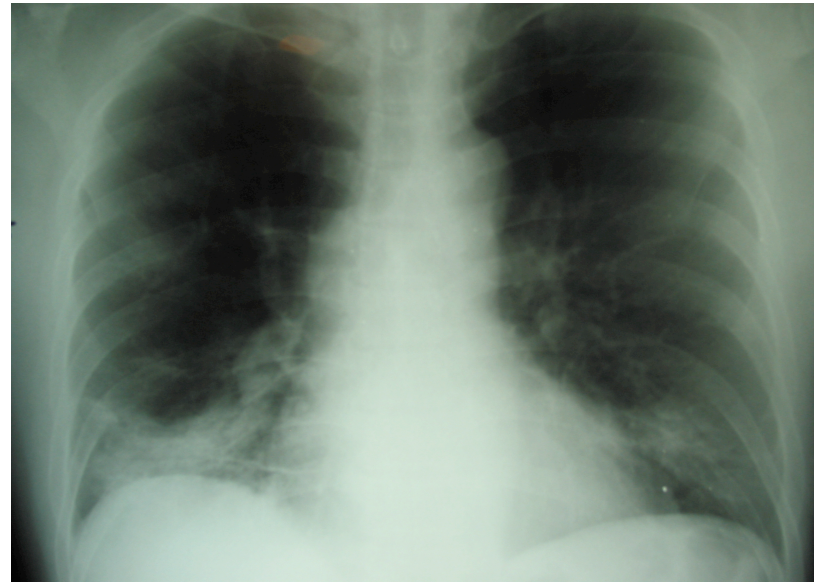
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Fever	100, 100%
Chills, rigors	73, 65%
Myalgia	61, 68%
Cough	57, 29%
Headache	56, 15%
Dizziness	43, 4%
Coryza	22, 3%



# Chest Radiograph Findings at Admission

- Normal 23-29%,
- Pneumothorax 3%
- Unilateral 46%, 54%
- Bilateral 29%





# Laboratory

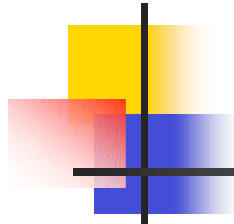
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- Normal or low (33%) WBC
- Lymphopenia (70%)
- Thrombocytopenia (45%)
- Elevated LDH (78%), creatine kinase (32%), LFTs (23%)



# Pathology

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# Lung

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- Range of morphological changes depending on length of illness
- Diffuse alveolar damage common but not universal
- Bronchial epithelial denudation, loss of cilia, and squamous metaplasia



# Outcomes

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- Requiring ICU admission 20-25%
- Requiring ventilation 12-15%
- Mortality 10-15%
- Predictors of mortality
  - advancing age, underlying illness, elevated LDH at presentation, elevated WBC



# Treatment

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# Treatment Options: Pros and Cons

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- Ribavirin
  - Con: Possible immune modulatory effect
  - Pro: No in vitro activity
- Interferon
  - Pro: Good in vitro activity
  - Con: High interferon blood levels in patients
  - Pro: Although systemic interferon levels high in patients, may not be adequate at site of infection (lung)
- Immune globulin
  - Pro: Passive immunity
  - Con: Immune enhancement